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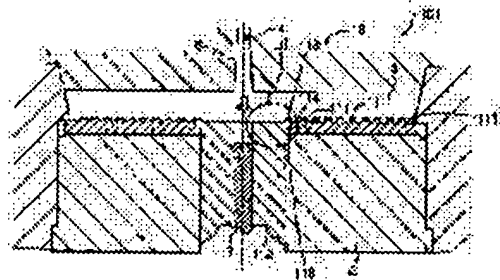
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(54) OPTICAL DISK MOLDING DEVICE, STAMPER DISPOSED AT OPTICAL DISK MOLDING DEVICE AND OPTICAL DISK MOLDED BY OPTICAL DISK MOLDING DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an optical disk molding device capable of reducing the production cost of an optical disk and shortening a production lead time, a stamper and an optical disk.

SOLUTION: A pawl member 113 for fixing the inner peripheral side end of a stamper 111 to a first mold 2 is provided with a reinforcing part 114, by which its mechanical strength is intensified. A thin part 118 engaging this reinforcing part 114 is formed on the side of the periphery inner than a recording region is formed at the stamper 111 in



correspondence to the reinforcing part. The strength of the stamper 111 is increased in such a manner, by which the high resistance force to fatigue crack is obtd. and the need for exchanging parts is eliminated. The production cost of the optical disk is thereby reduced and the production lead time is shortened.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to La Stampa with which optical disk shaping equipment and this optical disk shaping equipment are equipped, and the optical disk fabricated with the above-mentioned optical disk shaping equipment. As optical disk shaping equipment, it is especially related with the optical disk shaping equipment for DVD (Digital Versatile Disc).

[0002]

[Description of the Prior Art] An optical disk is conventionally fabricated with the making machine 1 as shown in drawing 11. In addition, each component which constitutes the making machine 1 concerned is constituted in the shape of a concentric circle focusing on the medial axis 4. A mold aperture is possible for such a making machine 1, when it carries out [mold closure], it has two metal mold 2 and metal mold 10 which form the opening section 5 for fabricating an optical disk, and La Stampa 3 which formed the irregularity 11 for mincing information to the optical disk fabricated to metal mold 2 in surface 3a is formed, and the sprue 6 for pouring the resin material for fabricating an optical disk into metal mold 10 is formed. The metal member 8 for the La Stampa immobilization for fixing the inner circumference side edge section of La Stampa 3 to metal mold 2 is screwed in the central part of metal mold 2 by metal mold 2. The claw part material 9 for immobilization projected in the diameter direction of the member 8 for immobilization is formed in the opening section side edge section of the member 8 for immobilization over the perimeter of the above-mentioned opening section side edge section so that surface 3a in the inner circumference section of La Stampa 3 may be pressed from the opening section 5 side to a metal mold 2 side. Therefore, surface 3a in the inner circumference side edge section of La Stampa 3 is pressed by the claw part material 9 for immobilization to metal mold 2 by metal mold 2 being equipped with the member 8 for the La Stampa immobilization. Moreover, the periphery side edge section of La Stampa 3 is held in another member at a metal mold 2 side so that it may illustrate, and it does in this way, and La Stampa 3 is fixed to metal mold 2. Moreover, along with the medial axis 4, the EJIEKUTO rod 7 which can slide is formed to the member 8 for the La Stampa immobilization. In addition, it is drawn in the member 8 for the La Stampa immobilization so that the EJIEKUTO rod 7 may be illustrated at the time of shaping of an optical disk.

[0003] Shaping of the optical disk which used such a making machine 1 is performed as follows. After attaching La Stampa 3 in metal mold 2, when metal mold 2 and metal mold 10 are closed, it fills up with resin material through sprue 6 to the opening section 5 which is the part which was formed among both, and which forms an optical disk, and the irregularity 11 minced by La Stampa 3 is imprinted by the above-mentioned resin material. Cooling of the resin material with

which it was filled up is performed after the imprint of the above-mentioned irregularity 11, and the mold aperture of metal mold 2 and 10 is performed after cooling. And pressure from below with the Plastic solid which is fabricated by the resin material and the opening section 5 which exist in sprue 6 with the EJEKUTO rod 7, and serves as an optical disk is performed after the above-mentioned mold aperture completion, and the above-mentioned Plastic solid is made to exfoliate from metal mold 2. The above-mentioned Plastic solid is transported to the exterior of a making machine 1 by the tripper after EJEKUTO actuation termination.

[0004]

[Problem(s) to be Solved by the Invention] In the production process of the above-mentioned optical disk by the making machine 1, in case resin material is injected into the opening section 5 from sprue 6, the force shown by the arrow head I which is going to stuff the member 8 for the La Stampa immobilization concerned into the interior of metal mold 2 acts on the member 8 for the La Stampa immobilization with the injection pressure of resin material. Therefore, the above-mentioned force acts on root partial 9a to the member 8 for the La Stampa immobilization in the claw part material 9 for immobilization repeatedly for every injection of the above-mentioned resin material. Since the part which, on the other hand, contains the claw part material 9 for immobilization is a part which affects the standard size of the optical disk fabricated, it is difficult the part to change the configuration and thickness freely. Therefore, when continuing shaping of an optical disk over a long period of time, there is a problem that a crack occurs in the direction shown by the arrow head II at the above-mentioned root partial 9a, and the above-mentioned root partial 9a finally causes fracture by the metal fatigue. According to the temperature change in the case of injection, the viscosity of resin material, etc., since the claw part material 9 for immobilization and surface 3a of La Stampa 3 cause repeat sliding, wear advances and they may start adhesive wear. Although holding La Stampa 3 by vacuum adsorption is also considered for solution of such a problem, the present condition is that any cure is not usually struck, either. Therefore, re-manufacture of very expensive La Stampa 3 is [that the member 8 for the La Stampa immobilization concerned needs to be re-manufactured] needed at every breakage of the member 8 for the La Stampa immobilization with above-mentioned adhesive wear. Therefore, in order to stop production whenever it is the breakage which requires a manufacturing cost, to reattach metal mold components and to start production again, it is difficult to form production planning, and there was a serious trouble that a manufacturing lead time started. It aims at offering La Stampa with which the optical disk shaping equipment and this optical disk shaping equipment which this invention was made in order to solve such a trouble, it can reduce the manufacturing cost of an optical disk, and can shorten a manufacturing lead time, and raise the quality of an optical disk are equipped, and the optical disk fabricated with the above-mentioned optical disk shaping equipment.

[0005]

[Means for Solving the Problem] It is optical disk shaping equipment which resin material is injected by the opening section formed in the thickness direction of the optical disk with which optical disk shaping equipment [like] is fabricated the 1st voice of this invention with the 1st and 2nd metal mold in which a mold aperture is possible, and fabricates the above-mentioned optical disk. Carry out orientation of the irregularity formed in the La Stampa front face in order to be doughnut-like disc-like and to engrave information in the 2nd metal mold of the above to the above-mentioned optical disk to the above-mentioned opening section side, and it is equipped with La Stampa the above-mentioned opening section and in the shape of a concentric circle. Are constituted so that the claw part material for immobilization with which the member for the La Stampa immobilization attached in the 2nd metal mold of the above is equipped may press the above-mentioned inner circumference side edge section from the above-mentioned

opening section side to the 2nd metal mold side of the above in the inner circumference side edge section of this La Stampa. It is optical disk shaping equipment and the above-mentioned claw part material for immobilization is characterized by having the reinforcement section which extends inside [above-mentioned] a stamper along the thickness direction of above-mentioned La Stampa, and reinforces the mechanical strength of the claw part material for immobilization concerned.

[0006] Moreover, it can also constitute so that the end face of the above-mentioned claw part material for immobilization by which optical disk shaping equipment [like] faces the above-mentioned opening section the 2nd voice of this invention may be arranged to the same field as the above-mentioned La Stampa front face.

[0007] It is used for optical disk shaping equipment [like] the 1st voice. the 3rd voice of this invention -- La Stampa [like] -- the above -- In La Stampa which has the record section where the irregularity for engraving information to the optical disk which is doughnut-like disc-like and is fabricated with the above-mentioned optical disk shaping equipment was formed in the front face Rather than the above-mentioned record section, it is on an inner circumference side by thickness thinner than the thickness of above-mentioned La Stampa in the above-mentioned record section, and is characterized by forming a part for the thin-walled part which engages with the above-mentioned reinforcement section of the above-mentioned claw part material for immobilization.

[0008] the 4th voice of this invention -- an optical disk [like] -- the above -- it is characterized by being fabricated with optical disk shaping equipment [like] the 2nd voice.

[0009]

[Embodiment of the Invention] La Stampa with which the optical disk shaping equipment and this optical disk shaping equipment which are 1 operation gestalt of this invention are equipped, and the optical disk fabricated with the above-mentioned optical disk shaping equipment are explained below, referring to drawing. In addition, in each drawing, the same sign is attached about the same component. Moreover, the above-mentioned metal mold 10 corresponds as 1 operation gestalt which achieves the function of the 1st metal mold, and the above-mentioned metal mold 2 corresponds as 1 operation gestalt which achieves the function of the 2nd metal mold.

[0010] The optical disk shaping equipment 101 in 1 operation gestalt is shown in drawing 1 . In addition, what expanded the III part shown according to a two-dot chain line to drawing 1 is shown in drawing 2 . Although the fundamental configuration in optical disk shaping equipment 101 is the same as that of the optical disk shaping equipment 1 mentioned above, it is different as follows with the member for the La Stampa immobilization, La Stampa, and metal mold. First, the member for the La Stampa immobilization and La Stampa are explained. The inner circumference side edge section of La Stampa 111 equivalent to above-mentioned La Stampa 3 is fixed to metal mold 2 by the member 112 for the La Stampa immobilization equivalent to the above-mentioned member 8 for the La Stampa immobilization. In the member 112 for the La Stampa immobilization, the claw part material 113 for immobilization equipped with the reinforcement section 114 is formed so that the reinforcement of root partial 9a of the claw part material 9 for immobilization in the member 8 for the La Stampa immobilization may be increased. In addition, the claw part material 113 for immobilization is formed over the perimeter of the member 112 for the La Stampa immobilization like the above-mentioned claw part material 9 for immobilization in the perimeter [edge] part by the side of the opening section 5 in the member 112 for the La Stampa immobilization. It is difficult to make the conventional claw part material 9 for immobilization extend from the limit on the specification of an optical disk to the opening section 5 side further, as mentioned above. so, with the optical disk shaping

equipment 101 of this operation gestalt It adds to the lobe 115 which extends in the opening section 5 side as claw part material 113 for immobilization rather than surface 111a of La Stampa 111 in which it is a part equivalent to the conventional claw part material 9 for immobilization, and the above-mentioned irregularity 11 is formed as shown in drawing 2 . The above-mentioned reinforcement section 114 which furthermore extends in a metal mold 2 side rather than surface 111a of La Stampa 111 was formed in one with the lobe 115.

[0011] Thus, by enlarging the section modulus in the claw part material 113 for immobilization, strong drag force can be acquired to a fatigue crack. The thickness of La Stampa 111 is usually 0.2-0.3mm in thickness, for example, set the thickness to 0.1mm in the reinforcement section 114. Moreover, in the claw part material 113 for immobilization, the thickness of a lobe 115 is 0.1mm. Thus, only by adding the reinforcement section 114 of 0.1mm thickness, even if it received 1 million times or more of repeated loads at planar pressure 8 kg/cm², the fatigue crack was not generated at the claw part material 113 for immobilization. Therefore, since the need of exchanging the member 112 for the La Stampa immobilization is lost, while being able to reduce the manufacturing cost of an optical disk, the conventional ingredient can be used in the member 112 for the La Stampa immobilization, and it becomes possible to manufacture the member 112 for the La Stampa immobilization by low cost, and a manufacturing lead time does not become long.

[0012] In addition, although the reinforcement section 114 made the cross section the shape of a rectangle with this operation gestalt so that it might illustrate, it is good also as the reinforcement section 117 which becomes in a triangular cross-section configuration like the claw part material 116 for immobilization of the optical disk shaping equipment 102 which it is not limited to this and shown in drawing 3 . Namely, what is necessary is for the force to join the member 112 for the La Stampa immobilization in the direction of arrow-head I by injection of resin material, as mentioned above, but just to determine the cross-section configuration of the above-mentioned reinforcement section so that thickness in the claw part material 113 for immobilization which presses La Stampa 111 in that case may be thickened and the section modulus may become large. Moreover, with this operation gestalt, like a lobe 115, although the reinforcement section 114 or the reinforcement section 117 was formed over the perimeter of the member 112 for the La Stampa immobilization, it is not limited to this and can also be intermittently formed along the perimeter of the member 112 for the La Stampa immobilization within the limit which the above-mentioned fatigue crack does not produce.

[0013] Moreover, like the claw part material 120 for immobilization of the member 122 for the La Stampa immobilization in the optical disk shaping equipment 103 shown in drawing 4 , the above-mentioned lobe 115 may be deleted and the claw part material 120 for immobilization may consist of only the reinforcement sections 121. Thus, end-face 120a which faced the opening section 5 of the claw part material 120 for immobilization with constituting is arranged at the same flat surface as surface 111a of La Stampa 111. In addition, the thickness which met in the thickness direction of an optical disk in the reinforcement section 121 is thicker than the thickness of the claw part material 9 for immobilization in the conventional making machine 1. The following effectiveness is done so by projecting on the same flat surface as surface 111a of La Stampa 111, and not forming a part like the claw part material 120 for immobilization. That is, as shown, for example in drawing 2 , the claw part material 113 for immobilization is usually equipped with the lobe 115 projected to the opening section 5 side rather than the same flat surface as the above-mentioned surface 111a. Therefore, in the formation part of a lobe 115, since the passage cross section of the resin material injected by the opening section 5 through sprue 6 becomes small compared with other parts, in case this part is passed, the rate of flow of the above-mentioned resin material becomes quick. Therefore, there is an inclination which the

inclination which enlarges molecular orientation in the optical disk fabricated appears, consequently worsens the birefringence of the properties required for an optical disk. Then, by deleting the part which is equivalent to the above-mentioned lobe 115 like the claw part material 120 for immobilization, the above-mentioned birefringence property could be improved and the birefringence was able to be raised about 30% in the usual process condition in the claw part material 120 for immobilization. Thus, in the optical disk formed using the claw part material 120 for immobilization, it became possible to be able to aim at improvement in the quality by improvement in a birefringence property, and to raise the yield of a product. In addition, as shown in drawing 5, naturally in the optical disk 301 formed using the claw part material 120 for immobilization, the crevice 302 formed like the optical disk 302 shown in drawing 6 corresponding to a lobe 115 is not formed.

[0014] On the other hand, in La Stampa 111, in an inner circumference side, it becomes by thickness thinner than the thickness of La Stampa 111 in the above-mentioned record section, and a part for the thin-walled part 118 which engages with the reinforcement section 114 of the above-mentioned claw part material 113 for immobilization is formed according to the configuration of the above-mentioned reinforcement section of the member 112 for the La Stampa immobilization rather than the record section in which the above-mentioned irregularity 11 is formed. In addition, as mentioned above, the thickness of La Stampa 1 is usually 0.2-0.3mm, and when the reinforcement section 114 which becomes in 0.1mm as mentioned above is formed, the thickness for a thin-walled part 118 is set to 0.1-0.2mm. In addition, corresponding to each configuration of the claw part material 120 for immobilization of the claw part material 116 for immobilization of the member 119 for the La Stampa immobilization shown in drawing 3, and the member 122 for the La Stampa immobilization shown in drawing 4, the configuration and thickness for the above-mentioned thin-walled part in La Stampa 111 also change.

[0015] By the claw part material 123 for immobilization of the member 125 for the La Stampa immobilization in the optical disk shaping equipment 104 shown in drawing 7, it has the configuration which formed the 1st protective layer 124 in contact surface 114a with La Stampa 111 in the reinforcement section 114 of the claw part material 113 for immobilization shown in drawing 2 further again. That is, as mentioned above, La Stampa 111 is pressed and held by the claw part material 113, 116, 120, 123 for immobilization to metal mold 2. For this reason, between La Stampa 111, metal mold 2, and La Stampa 111 and the claw part material 113, 116, 120, 123 for immobilization, during optical disk shaping, by the difference in the coefficient of thermal expansion of the viscosity of the resin material injected, an injection pressure, and the La Stampa 111 and the member 112, 119, 122, 125 for the La Stampa immobilization etc., in order that La Stampa 111 may move in the diameter direction of the optical disk shown by the arrow head IV in drawing 7 minutely, frictional force occurs. For this reason, migration of a wear metallurgy group atom occurs and the claw part material 113, 116, 120, 123 for immobilization is made to deteriorate in contact surface 114a of the reinforcement section 114. Then, as mentioned above, by forming the 1st protective layer 124 by the ion implantation, the reinforcement of contact surface 114a can be improved to contact surface 114a in the claw part material 123 for immobilization, and degradation of the claw part material 123 for immobilization can be suppressed to it. In addition, the same effectiveness can be acquired, even if it forms the 1st protective layer 124 of the above with the metallic compounds containing at least one sort in carbon, boron, and nitrogen and covers the above-mentioned contact surface 114a. In addition, the thickness of the 1st protective layer 124 is 600Å. Thus, by forming the 1st protective layer 124, 1 million continuous molding or more becomes possible, without changing the mechanical dimension of the member 112 for the La Stampa immobilization. Therefore, productivity can be

raised and a manufacturing cost can be held down low.

[0016] In addition, the 1st protective layer 124 may be formed in the contact surface with surface 3a of La Stampa 3 in the claw part material 9 for immobilization of the conventional member 8 for the La Stampa immobilization shown in drawing 11. In addition, a sign 126 is given to the member for the La Stampa immobilization which formed the 1st protective layer 124 in the claw part material 9 for immobilization like the optical disk shaping equipment 105 shown in drawing 8, and a sign 127 is given to the claw part material 9 for immobilization. Moreover, in order for the above-mentioned section modulus in the claw part material 127 for immobilization not to be different from the section modulus of the conventional claw part material 9 for immobilization in this member 126 for the La Stampa immobilization, the mechanical strength of the claw part material 127 for immobilization is as unchanging as the claw part material 9 for immobilization. However, since the reinforcement in the contact surface with La Stampa 3 in the claw part material 127 for immobilization is increased by forming the 1st protective layer 124 and degradation of the member 126 for the La Stampa immobilization can be suppressed, the productivity of an optical disk can be raised and a manufacturing cost can be held down low.

[0017] The 2nd protective layer 128 can be formed in the contact part which metal mold 2 and La Stampa 111 contact to the member 125 for the La Stampa immobilization in the thickness direction of an optical disk further again like the optical disk shaping equipment 106 shown in drawing 9. A heat-resistant lubricating oil can be used as an example of the 2nd protective layer 128 of the above. That is, the contact surface of the member 125 for the La Stampa immobilization and metal mold 2 is usually in the condition as it is of metalworking processing, and few clearances exist between the member 125 for the La Stampa immobilization, and metal mold 2. Therefore, the member 125 for the La Stampa immobilization and metal mold 2 rub, and wear and fatigue are caused. Furthermore, the invasion of the matter which is the above-mentioned resin material and which was disassembled or evaporated, and the additive of the above-mentioned resin material in the above-mentioned clearance is attained, and it becomes the cause of causing deformation of metal mold 2 and printing by the member 125 for the La Stampa immobilization, and metal mold 2. Then, a thin coat can be formed between the member 125 for the La Stampa immobilization, and metal mold 2 and La Stampa 111 by applying for example, the above-mentioned lubricant to the perimeter side of the member 125 for the La Stampa immobilization which met in the thickness direction of the optical disk fabricated as mentioned above, it becomes possible to prevent the above-mentioned wear and fatigue, and it becomes possible to lose the above-mentioned clearance further. Therefore, the matter which the above-mentioned resin material disassembled or evaporated, and the additive of the above-mentioned resin material could prevent trespassing upon the above-mentioned clearance, and became possible [losing the above-mentioned printing]. For this reason, the maintenance of metal mold 2 becomes easy and it becomes possible to raise the productivity of an optical disk. In addition, with this operation gestalt, although fats and oils were used as lubricant of the 2nd protective layer 128, it is not limited to this, and even if it uses straight mineral oil, such as a solid lubricant, vegetable oil, and an engine oil, etc., the same effectiveness can be acquired. In addition, vegetable oil is good to solidify the 2nd protective layer 128, and straight mineral oil is desirable to solidify.

[0018] Moreover, although the member 125 for the La Stampa immobilization which was explained with reference to drawing 7 as an operation gestalt which forms the 2nd protective layer 128 and which formed the 1st protective layer 124 was taken for the example, it is not limited to this and the 2nd protective layer 128 may be formed in each member 112, 119, 122, 126 for the La Stampa immobilization mentioned above.

[0019] The above explanation described the point that the member for the La Stampa

immobilization mainly differed from the conventional structure. Below, difference with the conventional structure is further explained about metal mold 2. Like each optical disk shaping equipments 101-106 mentioned above, the part engaged for each other is not prepared in the thickness direction of the optical disk fabricated with the members 112 and 119,122,125,126 for the La Stampa immobilization, and metal mold 2. Therefore, as mentioned above, the resin material injected through sprue 6 to the opening section 5 will press the members 112 and 119,122,125,126 for the La Stampa immobilization along the direction of arrow-head I, and the thrust at this time will act on the claw part material 113 and 116,120,123,127 for immobilization altogether. Then, with the optical disk shaping equipment 107 shown in drawing 10, in order to reduce the force of acting on the claw part material 113 and 116,120,123,127 for immobilization, the member side engagement section 130 for immobilization was formed in the member 129 for the La Stampa immobilization, and the metal mold side engagement section 142 was formed in metal mold 141, respectively so that metal mold 141 and the member 129 for the La Stampa immobilization might be engaged for each other. Thus, the above-mentioned thrust which acts on the member 129 for the La Stampa immobilization along the above-mentioned arrow-head I direction by making the member side engagement section 130 for immobilization and the metal mold side engagement section 142 engaged is distributed by two places of the engagement part of the claw part material 123 for immobilization and the member side engagement section 130 for immobilization, and the metal mold side engagement section 142. Therefore, the force of acting on the claw part material 123 for immobilization can be reduced, and strong drag force can be acquired to the fatigue in the claw part material 123 for immobilization. While 1 million continuous molding or more can become possible, being able to raise the productivity of an optical disk and being able to hold down a manufacturing cost low by taking such a configuration, it becomes possible to shorten a manufacturing lead time.

[0020] In addition, although the 1st protective layer 124 was formed in the claw part material 123 for immobilization with optical disk shaping equipment 107 as shown in drawing 10, and the 2nd protective layer 128 is further formed in the perimeter side of the member 129 for the La Stampa immobilization which met in the thickness direction of the optical disk fabricated, the 1st protective layer 124 and the 2nd protective layer 128 are not indispensable configurations. That is, the above-mentioned member side engagement section 130 for immobilization and the metal mold side engagement section 142 can be applied also to the above-mentioned optical disk shaping equipments 101-105. Moreover, with optical disk shaping equipment 107, although prepared only in one place, the above-mentioned engagement section is not limited to this, and as long as there is no problem on manufacture, they may be prepared between the member for the La Stampa immobilization, and metal mold. [two or more] Moreover, as long as there is no problem on manufacture, the member for the La Stampa immobilization may be made to project to a metal mold side, although metal mold 141 is made to project to the member 129 side for the La Stampa immobilization and the above-mentioned engagement part is formed with optical disk shaping equipment 107. Moreover, with optical disk shaping equipment 107, although the engagement side 131 of the engagement part of metal mold 141 and the member 129 for the La Stampa immobilization has extended along the diameter direction of the optical disk fabricated, it may not be limited to this and may be a taper-like.

[0021] Also in the optical disk shaping equipments 101-107 which have the configuration explained above, shaping actuation of the optical disk performed with the conventional making machine 1 and same shaping actuation are performed. Therefore, explanation of the above-mentioned shaping actuation in the optical disk shaping equipments 101-107 is omitted.

[0022]

[Effect of the Invention] As explained in full detail above, the 1st voice, according to optical disk

shaping equipment [like], by the thing of this invention for which the claw part material for immobilization was equipped with the reinforcement section, the thickness of the claw part material for immobilization concerned in the thickness direction of the optical disk fabricated is increased, and the mechanical strength of the claw part material for immobilization concerned can be reinforced. Therefore, since the need of exchanging the member for the La Stampa immobilization equipped with the above-mentioned claw part material for immobilization is lost, the manufacturing cost of an optical disk can be reduced, and while becoming possible to shorten a manufacturing lead time, the conventional ingredient can be used as a member for the La Stampa immobilization, and it becomes possible to manufacture the member for the La Stampa immobilization by low cost.

[0023] Moreover, the end face of the above-mentioned claw part material for immobilization which faces the opening section according to optical disk shaping equipment [like] the 2nd voice of this invention can also be arranged to the same field as the La Stampa front face. According to such optical disk shaping equipment, since the above-mentioned end face of the above-mentioned claw part material for immobilization has not projected to the above-mentioned opening section side, the passage cross section of the resin material injected by the above-mentioned opening section at the time of shaping of an optical disk can be taken widely, and the rate of flow of the above-mentioned resin material can be lowered. Therefore, since a birefringence property can be raised, the quality of an optical disk can be raised.

[0024] Moreover, the 3rd voice, according to La Stampa [like], by the thing of this invention for which a part for a thin-walled part was formed in the inner circumference side, corresponding to a part for the above-mentioned thin-walled part, the thickness of the claw part material for immobilization can be increased, and the mechanical strength of the claw part material for immobilization concerned can be reinforced rather than a record section. Thus, according to the La Stampa concerned, since the need for exchange of the member for the La Stampa immobilization which enables enhancement of the mechanical strength of the above-mentioned claw part material for immobilization, and is equipped with the above-mentioned claw part material for immobilization is abolished, the manufacturing cost of an optical disk can be reduced.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is a sectional view in the optical disk shaping equipment which is 1 operation gestalt of this invention.

[Drawing 2] It is the enlarged drawing of the III section shown in drawing 1.

[Drawing 3] It is a sectional view in the modification of the member for the La Stampa immobilization shown in drawing 1.

[Drawing 4] It is a sectional view in other modifications of the member for the La Stampa immobilization shown in drawing 1.

[Drawing 5] It is the sectional view of the optical disk fabricated with optical disk shaping equipment equipped with the member for the La Stampa immobilization shown in drawing 4.

[Drawing 6] It is the sectional view of the optical disk fabricated with optical disk shaping equipment equipped with the conventional member for the La Stampa immobilization.

[Drawing 7] It is a sectional view in another modification of the member for the La Stampa immobilization shown in drawing 1.

[Drawing 8] It is a sectional view in the modification of further others of the member for the La Stampa immobilization shown in drawing 1.

[Drawing 9] It is a sectional view in still more nearly another modification of the member for the La Stampa immobilization shown in drawing 1.

[Drawing 10] It is a sectional view in the modification of further others of the member for the La Stampa immobilization shown in drawing 1.

[Drawing 11] It is a sectional view in conventional optical disk shaping equipment.

[Description of Notations]

5 -- The opening section, 101-107 -- Optical disk shaping equipment, 111 -- La Stampa, 112 -- The member for the La Stampa immobilization, 113 -- The claw part material for immobilization, 114 -- Reinforcement section, 114a [-- The member for the La Stampa immobilization, 120 / -- The claw part material for immobilization, 120a / -- An end face, 124 / - The 1st protective layer, 128 / -- The 2nd protective layer, 130 / -- The member side engagement section for immobilization, 142 / -- Metal mold side engagement section.] -- The contact surface, 115 -- A lobe, 118 -- A part for a thin-walled part, 119

[Translation done.]